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Great Britain Combat Estimate 1940 &amp; 1941

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January 7, 1940.  
(Revised as of above date.  
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UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND. \*

Combat Estimate

### I. SYSTEM OF NATIONAL DEFENSE.

#### 1. Coordination of National Defense.

a. Military Forces. The military forces of the nation consist of the Army, the Royal Air Force, and the Royal Navy, the three services functioning under separate and coordinate ministries, namely, the War Office, the Air Ministry and the Admiralty, respectively. These ministries are loosely co-ordinated by the Minister for the Co-ordination of Defence. See paragraph 1 c, and Appendix 1, Organization of the War Office.

b. Supreme Command. Supreme command of the military forces is vested in the Crown but is exercised by the Government through the respective ministries.

c. Committee of Imperial Defence. The Committee of Imperial Defence is an advisory body set up in 1904 to coordinate the policies and plans for national defense. The Prime Minister is the Chairman and the Minister for the Co-ordination of Defence is the Deputy-Chairman. The remaining membership is elastic, but in time of peace generally includes the three service Ministers, their Chiefs of Staff, the Chancellor of the Exchequer, the Lord Privy Seal (responsible for Air Raid Precautions), and the Secretaries of State for the Home Department, for Foreign Affairs, for Dominion Affairs, for India and Burma, and for the Colonies. Other officials, including representatives of the self-governing Dominions, are included when necessary. The purpose of the Committee is to provide a representative body of high government officials to make a centralized study of the defense needs of Great Britain and the Empire, with especial attention to the requirements of the three services, their coordination with each other, with other departments, and with the Dominions. The Deputy-Chairman, the Minister for the Co-Ordination of Defence, is the actual working head of the Committee and as such the official representative and adviser of the Prime Minister in defense matters. To assist him he has a Secretary and a number of assistants (eight just before the war), most of whom are service officers. Preparatory work is done by sub-committees of which

\* This estimate includes the British military forces in Crown Colonies and Egypt but not in India (except where specifically stated) nor in the Dominions. Combat Estimates for 1937 have been published for India, Canada and Australia. Estimates for Ireland (Irish Free State), New Zealand and Union of South Africa are no longer published but are available in manuscript form in the Military Intelligence Division, War Department General Staff.

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there have been at times over 50, the principal ones being those of Defense Policy and Requirements, Chiefs of Staff, Joint Planning, Manpower, and Principal Supply Officers. Sub-committee reports are first analysed by the Secretariat and then referred to the entire Committee for action. The action of the Committee is advisory only and the final decisions are made by the Government (operating through the War Cabinet) after which they are carried into effect by the ministries concerned. In non-controversial matters not involving questions of policy the various members of a sub-committee, say the three Chiefs of Staff, often act in their respective capacities to put into effect action mutually agreed upon. It will be noted that the Minister for the Co-ordination of Defence is not set above the three service ministries and that his relationship to them is only as an agent of and adviser to the Prime Minister. In time of war when defense matters are dominant the Prime Minister tends to become the actual working head of the Committee and give it a greater part of his attention.

d. War Cabinet. On September 3, 1939, the date of the declaration of war, a War Cabinet was formed to provide for the expeditious prosecution of the war. It consists of nine members, the Prime Minister, the Chancellor of the Exchequer, the Minister for Co-ordination of Defence, the Lord Privy Seal, the First Lord of the Admiralty, the Secretaries of State for Foreign Affairs, for War, and for Air, and Lord Hankey, Minister without Portfolio. Lord Hankey was Secretary of the War Cabinet during the World War and later for many years the Secretary of the Committee of Imperial Defence. This War Cabinet replaces the previous Cabinet of about 20 members. The members continue to perform their normal departmental duties. The relations between the War Cabinet and the Committee of Imperial Defence are not at this time clear, but based upon the similarity in the membership and on World War precedent, it is believed that for the duration of the war the functions of the Committee will generally pass to the Cabinet which will be aided and advised by the service Chiefs of Staff and the Committee Secretariat.

e. Ministry of Supply. On July 13, 1939, the Ministry of Supply Act was passed, ending long Parliamentary criticisms that the governmental munitions procurement program was lagging. On the face of the Act it gave the new Ministry wide powers for centralized procurement and control of munitions and raw materials. It made three general provisions:

(1) The powers and duties of the Director-General of Munitions of the War Office were transferred (in August 1939) to the Ministry. This gave the Ministry the responsibility for the manufacture and purchase of supplies for the Army, for further details of which see paragraph 6 g.

(2) The Ministry was given power to buy, manufacture, produce and store any articles required for the public service; except that it could not encroach on the procurement functions of any department of the government without the consent of that department. This exception substantially nullifies the apparent wide procurement powers. Neither the Navy, the Air Force, nor the Air Raid Precautions agencies have given that consent; so that, with the exception of items common to two services, the Ministry procures supplies for the Army only.

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(3) The Ministry may make inventories of private stocks of raw and finished materials, may compel deliverance of any article or the carrying out of any work for the public service, and may set maximum prices for raw materials. These wide powers of price and priority control will undoubtedly become the most important functions of the Ministry. During the first days of the war committees for the control of most raw materials were set up, but details of their functioning are not available. The maximum prices of many raw materials have been fixed at about the price ruling at the time the war started.

II. ARMY

2. Personnel.

a. Strength. The following is the estimated strength of the elements of the Army as of December 31, 1939, together with the origin of the various elements, since all have been consolidated into a single "British Army" and the distinction between the elements has vanished:

Origin	Officers	Men	Totals
Regular Army (exclusive of India and Burma)	22,000	320,000	342,000
Colonial and Indian troops		20,000	20,000
Militia (conscript force)(1)		462,000	462,000
Territorial Army (2)	19,000	480,000	499,000
Supplementary Reserve	3,000	42,000	45,000
Officers Training Corps		6,000	6,000
Malta and Bermuda Militia		1,000	1,000
Commissioned from ranks	10,000		10,000
Total - British Army proper	54,000	1,331,000	1,385,000
British Army in India and Burma	2,000	33,000	35,000
Total organized forces	56,000	1,364,000	1,420,000
Additional untrained manpower			3,500,000
Total available manpower (3)			4,920,000

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- (1) Of these about 35,000 were inducted on July 15, 1939, and about 20,000 on September 15, 1939. Most of the remainder were called to service during November and December 1939.
- (2) Of these about 250,000 have been recruited since May 1939.
- (3) This includes the white manpower of the United Kingdom and colonies only. Based on World War experience relatively few colored troops will be used for military service.

b. Distribution. The following is an estimate of the distribution of the British Army as of December 31, 1939:

Location	Men	Divisions
Great Britain		
Field Forces ready for combat	150,000	2
Field Forces <u>not</u> ready for combat	600,000	26 (1)
Antiaircraft and coast defense units	175,000	-
France - British Expeditionary Force	350,000	5
Eastern Mediterranean Reserve	60,000	3
Other overseas garrisons	50,000	-
British Army proper	1,385,000	36
India and Burma		
British troops	35,000	
Indian troops	185,000	
Total available forces	1,605,000	

- (1) It is possible that some 20 additional divisions have been formed from the Militia. If not, this probably will be done early in 1940.

3. Organization.

a. Command. The command of the Army is exercised by the Army Council. The Chief of the Imperial General Staff as the senior military member thereof

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has some of the attributes of the commander in chief, but in general is co-ordinate with the other military members.

b. War Office.

(1) Organization. The organization of the War Office, to include the principal components thereof, is shown in diagrammatic form in Appendix 1, Organization of War Office. It will be noted that the principal departments are coordinate and are responsible to the Secretary of State for War through the Army Council.

(2) Army Council. The Army Council exercises the command of the Army and all orders are issued in its name. Its formal meetings are rare but informal meetings, attended by the members concerned with the subjects at hand, are frequently held. The membership shown in Appendix 1.

(3) Departmental Functions. The departments of the War Office (see Appendix 1) collectively perform the combined duties of the General Staff and the offices of the chiefs of the arms and branches in our (the United States) service. The functions of the principal departments are as follows:

(a) The Imperial General Staff. The Department of the Chief of the Imperial General Staff is basically concerned with military policy, which includes war planning, training, historical research and military intelligence. It is divided into the three directorates of Military Operations and Intelligence, Staff Duties, and Military Training. In addition there has been added within the last year a Directorate-General of Air and Coast Defence and a Directorate of Training and Organization (Coast Defence and Antiaircraft). Seven inspectors of arms and services are attached to the Military Training Directorate. With respect to training these officers have functions analogous to the chiefs of branches in our service. In general the functions of the Imperial General Staff combine G-2, G-3 and War Plans Divisions of our War Department General Staff, as well as some of those of certain chiefs of branches.

(b) Adjutant-General. The Department of the Adjutant-General to the Forces is concerned with personnel, to include recruiting, organization, administration, military discipline and medical services. In general its functions combine those of G-1, The Adjutant General, the Surgeon General and the Judge Advocate General in our service.

(c) Quarter-Master-General. The Department of the Quarter-Master-General is concerned with quartering the Army, road, railway and sea transport, construction and maintenance of buildings and fortifications, supply of food, forage and fuel, and remount and veterinary service. In general its functions include those of G-4 and some of those of the Quarter-master General and the Chief of Engineers in our service.

(d) Director-General of Munitions Productions. In August 1939 the Department of the Director-General of Munitions Production, except for the section headed by the Deputy Master-General of the Ordnance, was transferred to the Ministry of Supply, for which see paragraph 1 e.

(e) Master-General of the Ordnance. The Department of the Master-General of the Ordnance is concerned with the development, design,

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and inspection of war materiel, to include artillery, small arms, ammunition, motor vehicles of all kinds, chemical defense, engineer and signal materiel, general stores and clothing. It sets up the demands for these items but they are manufactured or purchased by the Ministry of Supply. For nearly two years this Department was included in the Department of the Director-General of Munitions Production (see next preceding subparagraph). It is inferred only that this Department has been reconstituted.

(f) Director-General of the Territorial Army. The Department of the Director-General of the Territorial Army was abolished early in September 1939 when all separate elements were consolidated into a single "British Army".

(g) Permanent Under-Secretary of State for War. The Department of the Permanent Under-Secretary of State for War is charged with the conduct of War Office business, including all finance and accounting, and with administration of the Chaplain's Department and the Pay Corps. This conservative civilian department, because of its powers of veto in financial matters, has great influence in the War Office.

c. Organization of the Army.

(1) General Organization. In August 1939 the Army was organized into the following major units:

Forces at home:

Field Force.

Regular Army -       5 Infantry divisions  
                          2 Armoured divisions

Territorial Army- 18 Infantry divisions  
                          6 Motorized (Infantry) divisions  
                          2 Armoured divisions

Total Field Force       33 Divisions

Regular and Territorial corps and army troops.

Antiaircraft Command, Territorial Army:

5 Antiaircraft Divisions.

Coast defense units, mostly Territorial Army

Forces abroad (all Regular Army):

Eastern Mediterranean Strategic Reserve (Egypt and Palestine):

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2 Infantry divisions

1 Mixed Infantry and Cavalry  
division

British Army in India: 3 Cavalry regiments

37 Infantry battalions

Colonial overseas garrisons.

(2) British Expeditionary Force. Early in September 1939 an expeditionary force, consisting of five Infantry divisions, corps and army troops, and a large number of service and line of communication units, was sent to France. This force has been reinforced with additional non-divisional and service units at the rate of several thousand a week since that time. The combat elements have taken position in general on the left flank of the French forces and have not, with limited exceptions, been in action. An extensive line of communication establishment has been building.

(3) Territorial Organization. For purposes of administering the Army at home the United Kingdom is divided into six territorial commands and two districts. The Aldershot Command consists of the large garrison of Aldershot. The Northern Ireland District is of small importance as few troops and no Territorial divisions are stationed there. The London District garrisons certain ceremonial regular troops and is the location of two Territorial divisions. The five remaining commands are each divided into from two to four areas, with a total of 14. In each of 12 of these areas two Territorial Infantry or Motorized divisions were located in time of peace. The Antiaircraft Command operates directly under the War Office and is not responsible to any territorial commander.

(4) Cavalry Division. There is no organized horse Cavalry division or brigade.

(5) Infantry Division. An Infantry division consists of three brigades of three rifle (light machine gun) battalions [see par. 3 d (7) (a)]; three field artillery regiments [see par. 3 d (2)]; one antitank artillery regiment [see par. 3 d (2)]; one mechanized Cavalry regiment [see par. 3 d (4) (a)]; with Signals, Army Service Corps, Engineers, Army Medical Corps, and Military Police units of unknown composition. The war strength of the division is approximately 12,425 and it is equipped with approximately 10,000 rifles, 570 Bren light machine guns, 280 cal. .55 antitank rifles, 48 2-pdr. antitank guns, 72 25-pounder gun-howitzers, 18 3-inch trench mortars, 108 2-inch trench mortars, 90 armored machine gun carriers, 28 light tanks, and 44 armored scout carriers. The division is completely motorized or mechanized, all transport vehicles being wheeled. There is not enough transportation to transport all foot troops. It will be noted that this division does not include any heavy machine gun battalions, medium artillery, Infantry tanks, or gas units. When the mission requires it the division will be reinforced as required, which will increase its

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power but decrease its mobility.

(6) Motorized (Infantry) Division. Based on unofficial information, a Territorial motorized (Infantry) division consists of two brigades of three motorized rifle battalions, two field artillery regiments, one motor-cycle battalion of unknown composition, with service elements. All personnel are carried in motor transport. Its estimated war strength is about 8,000.

(7) Armoured Division. During the summer of 1939 the old Regular Army Mobile Division was augmented by an additional brigade and then divided into two armoured divisions. About the same time two of these divisions were organized in the Territorial Army. Reliable information of the exact composition of an armoured division is not available, but it is estimated that it consists of one brigade of three light tank battalions, one brigade of three medium tank battalions, two motorized Infantry battalions, two battalions of mechanized horse artillery, with Engineer, Ordnance, Signals, Medical and transport elements. The estimated war strength is about 10,000. [See also paragraph 3 d (4).]

(8) Antiaircraft Division. In February 1939, the date of the last official information, there were five divisions of the Antiaircraft Command, but this number may since have been increased. Certainly the divisions then in existence have been brought to full strength. There is no official information of organization, but it is believed that the divisions vary in strength and composition according to defense requirements. In February a typical division consisted of five brigades, each brigade consisting of two antiaircraft gun regiments of four batteries each, two searchlight battalions of four batteries each, one light antiaircraft regiment of four batteries, with Army Service Corps, Signals, and other service elements. At that time there were a total of 22 brigades with 124 gun batteries, 120 searchlight batteries, and 25 light gun batteries. Undoubtedly this number has since been increased. At that time three divisions had their armories in the vicinity of London, and one each in the vicinity of Liverpool and Glasgow. The total peace strength of the five divisions was about 87,000, with an estimated war strength of about 125,000.

d. Combatant Arms. Except as otherwise noted, the organization of the combatant arms given is of the Regular Army in February 1939, exclusive of India and Burma, and strengths are authorized peace strengths with war strengths unknown.

(1) Air Force. Twelve Regular and two Auxiliary Air Force army cooperation squadrons are designated for service with the Army. See Section III, Air Force, for further details. Fighter and light bomber squadrons cooperate with the field forces as required and available.

(2) Artillery.

(a) Regular Army. The artillery of the Regular Army is formed into the Royal Regiment of Artillery, with a strength of 26,186. This in turn is divided into the Field Branch, consisting of all horse, field, mountain, medium and mobile heavy regiments, and the Coast Defence and Antiaircraft Branch, which title explains its composition. The following

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is the number of batteries in the Regular Army, with other information:

Type Batteries	Number of Batteries				Type Guns	Guns per Battery
	Home	Egypt & Col- onies.	India	Total		
Field Branch Horse (mechanized)	5	2	3	10	13-pdr. guns and 3.7" howitzers	4-6
Field	31	2	46	79	18- and 25-pdr. guns and 4.5" howitzers	4
Mountain	-	-	2	2	3.7" howitzers	4
Medium	19	-	6	25	60-pdr. guns and 6" howitzers	4
Heavy	4	-	-	4	Various	?
Survey	1	-	-	1	Sound and flash ranging	-
CD and AA Branch Heavy seacoast	5*	19	3	27	Various	
Antiaircraft in defended ports	-	3	-	3	Unknown	
Antiaircraft gun	9	8	1	18	3- and 3.7-inch anti- aircraft guns	8
Light antiaircraft gun	4	-	-	4	40-mm., automatic cannon	?
Antitank	20	-	-	20	2-pdr. antitank guns	12
Antiaircraft searchlight**	6	1	-	7	90-cm. antiaircraft searchlights	?

\* These five batteries are located at the proving grounds at Shoeburyness. All coast defense batteries at defended ports in Great Britain are manned by Territorial units.

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\*\* In the Regular Army the antiaircraft searchlights are manned by the Artillery while in the Territorial Army they are manned by Engineers. This is subject to change.

(b) Territorial Army. In addition to the Artillery components of the 26 Territorial divisions of the Field Force and of the five Antiaircraft divisions (see par. 3 c.), it is estimated that there were on October 1, 1939, in the Territorial Army four regiments of horse Artillery, four brigades of medium Artillery, 1 1/4 heavy (coast defense) regiments, and two survey regiments. As far as known the field regiments have not been converted to the Regular Army organization, but each consist of three batteries of 18-pounder guns and one battery of 4.5-inch howitzers. A medium artillery brigade consists of one battery of four 60-pounder guns and three batteries, each of four 6-inch howitzers.

(c) Regimental Organization. A divisional field regiment consists of two batteries (corresponding to our battalions), each consisting of three troops (or batteries) of four 18-pounder gun-howitzers each. A mechanized horse artillery regiment consists of two batteries (battalions) in a similar manner except that each battery consists of but two troops of four guns each. A divisional antitank artillery regiment consists of four batteries, each equipped with 12 2-pounder guns. Medium and heavy artillery regiments, as far as known, consist of four batteries each.

(3) Cavalry. The Cavalry consists of two Guards regiments, in peace on ceremonial duty in London, and two line regiments on duty in Palestine. All Cavalry is horsed (see next succeeding subparagraph). Each Guards regiment consists of two 4-troop squadrons, with a strength of 24 officers and 419 men. Each line regiment consists of three 3-troop sabre squadrons, with a strength of 21 officers and 458 men. In the Territorial Army there are 14 Yeomanry regiments, which are horsed units.

(4) Armoured Corps. In April 1939 all mechanized Cavalry and the Royal Tank Corps (renamed the Royal Tank Regiment) were amalgamated to form the Royal Armoured Corps, which now consists of 18 mechanized Cavalry regiments and eight Tank battalions. Cavalry and Tank units in general have similar equipment, and it is believed that Cavalry regiments and Tank battalions are generally of similar strength and organization. Of the total of 26 regiments or battalions, 12 form the mechanized units of the Armoured divisions: see par. 3 c (7) /, three Cavalry regiments (one armoured car) and two Tank battalions serve in Egypt, two or three Cavalry regiments serve in India, three or four Tank battalions man Infantry tanks at home, and the remaining four or five are divisional mechanized Cavalry regiments. It is estimated that there were about 30 Territorial armoured regiments or battalions in August 1939, of which 12 formed the two Armoured divisions and the remainder were divisional mechanized Cavalry regiments. Neither the organization nor the equipment of Armoured Corps units are known, except for the divisional mechanized Cavalry regiment, as they have been completely reorganized and reequipped within the last year.

(a) Divisional Mechanized Cavalry Regiment. A divisional mechanized Cavalry regiment, with an estimated war strength of 20 officers

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and 400 men, equipped with light tanks and armored scout carriers (which are believed to be substantially the same as the Infantry machine gun carriers). It consists of regimental headquarters, with four tanks and two carriers; a headquarters squadron, consisting of a squadron headquarters, an administrative troop, and a motorcycle troop with 41 motorcycles; and three armored squadrons, each consisting of a squadron headquarters with two tanks and two carriers, two light tank troops with three tanks each, and four carrier troops with three carriers each. The total equipment of the regiment is 28 light tanks and 44 armored scout carriers.

(5) Chemical Warfare. There is no Chemical Warfare branch as such and no Chemical Warfare Troops, except one Chemical Defence Company, Royal Engineers, for experimental duty with the Research Department. The Master-General of the Ordnance is charged with experimental and development work, and administers the Chemical Defence Committee and the Chemical Defence Research Department. The Committee is an advisory and consultative body of scientific experts including representatives of the three defense services and eminent civilian scientists. The Research Department carries out research and experiment, presumably only for defense against chemical agents, but actually also for chemical warfare. Research and experiment is conducted for the three services, as well as for gas defense under the Air Raids Precautions Act.

(6) Engineers. The Royal Engineers are organized to carry out work of a technical nature requiring the use of special tools or the possession of technical skill. Officers when first commissioned receive special engineering training and a large number of the enlisted men are tradesmen (corresponding generally to specialists in our service). The corps is divided into three main branches:

(a) Field, Fortress and Antiaircraft Units. The following table includes the principal units under this category. Strengths of units vary somewhat under certain circumstances:

Number Units		Designation and Function	Peace Strength	
Home	Abroad		Officers	Men
1	0	Field squadron of headquarters troop and two field troops. For duty with Cavalry.	5	137
10	5	Field companies. For duty with Infantry divisions.	4	112
2	0	Field park companies. For duty with Infantry divisions.	4	109
1	0	Survey battalion. For map survey and reproduction.	-	-
1	0	Field survey company. Same function as survey battalion.	-	-
1	15	Fortress companies. Man seacoast and anti-aircraft and engage in construction and repair searchlights in seacoast defenses. Strengths vary from 90 to 150.		
1	0	Antiaircraft battalion. Mans antiaircraft searchlights. (Possibly since transferred to Artillery.)	31	860

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(b) Transportation. The Railway Training Centre with two railway companies (each with the strength of about 4 officers and 185 men) forms a nucleus of trained railway operating personnel.

(c) Works Services. The Royal Engineers are charged with the construction and maintenance of all buildings and fortifications and for the supply of water and electricity. Staff officers from the corps are available to commanders but there are no units in this branch. In the War Office this service is in the Department of the Quarter-Master-General.

(7) Infantry. The Infantry of the Regular Army in August 1939 consisted of five Foot Guards regiments, with a total of 12 battalions, and 64 regiments of the line, each of two battalions; making a total of 140 battalions. At that time 62 battalions were at home, 37 in India, 15 in Palestine, six in Egypt, five in China, and the remainder in overseas colonies. Under the Caldwell system, adopted in 1874, each regiment was given a recruiting district in Britain and had a depot for recruit training. One battalion of the regiment was at all times to be stationed at home and one abroad. In general, this system is still followed except that overseas requirements demand more than half of the battalions. There were in August 119 original Territorial Infantry battalions and 100 duplicate units (formed at the time of the doubling of the Territorial Army). All Regular and Territorial battalions are formed into either rifle or heavy machine gun battalions in unknown proportions. The following is the manner of organization and equipment of the two types of battalions:

(a) Rifle (INF) Battalion. The rifle battalion organization is based on the Bren caliber .303 light machine gun. Completely motorized, it has a war strength of 22 officers and 623 men. The Headquarters Company has an antiaircraft section of four Bren machine guns, a mortar platoon of two 3-inch trench mortars, a pioneer platoon, and a carrier platoon of ten machine gun carriers, each with one Bren machine gun. Each of the four rifle companies consists of three machine gun platoons, each consisting of three squads with one Bren machine gun each and of one mortar squad with one 2-inch trench mortar. Each platoon or section has one caliber .55 antitank rifle. Officers carry revolvers and men rifles. Each battalion has a total of 22 revolvers, 623 rifles, 50 Bren machine guns, 10 machine gun carriers, two 3-inch and 12 2-inch trench mortars, and 18 antitank rifles. This battalion is the basic unit of the Infantry division.

(b) Heavy Machine Gun Battalion. The heavy machine gun battalion is based on the caliber .303 Vickers heavy machine gun. Each consists of four companies, each equipped with 12 guns. It is completely motorized and it is probable that guns are carried loose in light trucks. War strength is unknown. These battalions are corps troops and will be attached to divisions for defensive or similar situations.

(8) Corps of Signals. The Royal Corps of Signals of the Regular Army has a strength of 292 officers and 6,430 men. It is organized into one G.H.Q. Signals company; one corps Signals (battalion); five divisional Signals; one Armoured Divisional Signals of three squadrons; one Signal troop (armoured car regiment); two antiaircraft brigade Signals; 14 artillery Signal sections, each of one officer and 26 men; three Tank Signal sections;

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one wireless company; eight Signal companies for the territorial commands at home; and eleven Signal companies or sections in Egypt and overseas garrisons. Except as given, the strength and organization of units are unknown.

(9) Colonial and Indian Troops. Prior to the present war there were in the colonies, mostly in China, Malaya and Malta a total of 294 officers and 9,228 men of Colonial and Indian troops (with a status analogous to our Philippine Scouts) serving with the British Army. Since that time it is estimated that 15,000 additional Indian troops have been added to these. The units are mostly Infantry though there are some Artillery.

e. Non-Combatant Branches.

(1) Medical Corps. The Royal Army Medical Corps, with a strength of 705 officers and 4,766 men, was organized in time of peace into 20 companies at garrisons at home and abroad, and furnishes the strictly medical personnel for military hospitals and staffs. War units were not formed in time of peace and organizations of these units are unknown. In general a complete evacuation service is provided, with small medical units in battalions, ambulance and dressing station service in divisions, and the complete chain of evacuation units back to general hospitals.

(2) Army Service Corps. The Royal Army Service Corps, with a strength of 705 officers and 8,385 men, is responsible for the storage and issue of fuel, light, rations, and general supplies, for transportation including the repair of vehicles assigned thereto, and for the provision and repair of barracks and quarters. In time of peace it was formed into 66 mechanical transport companies, nine supply companies, and one mixed company of various strengths, these stationed at garrisons at home and abroad. War organizations are in general unknown. Service Corps units in the division provide for the transport and supply of ammunition, gasoline and oil, and general supplies, with units of unknown strength and organization.

(3) Ordnance Corps. The Royal Army Ordnance Corps, with a strength of 676 officers and 5,167 men, supplies and maintains barrack, camp and warlike stores, clothing and vehicles other than those driven by personnel of the Army Service Corps. The term "warlike stores" includes weapons, ammunition, electrical, bridging and gas defense equipment, etc. In time of peace it was organized into 14 sections stationed at various garrisons. In time of war there are Ordnance staff officers with the principal command echelons. There are no Ordnance units within the division, the corps providing the necessary service therefor. Details of war organization are unknown.

(4) Educational Corps. The Army Educational Corps, consisting of 82 officers, 432 warrant officers and sergeants, and 239 Queen's Army Schoolmistresses, provides adult general education for enlisted men and schooling for service children where other facilities do not exist.

(5) Other Branches. There are in addition the following branches whose functions are indicated by their names:

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	<u>Officers</u>	<u>Men</u>
Corps of Military Police	0	581
Royal Army Chaplain's Department	147	0
Royal Army Pay Corps	196	962
Royal Army Veterinary Corps	21	95
Army Dental Corps	154	210

f. Second Line Forces. Since all elements of the Army on active service have been consolidated into a single "British Army", the second line forces described below in a sense no longer exist, but are included to indicate the peacetime organization.

(1) Regular Army Reserve.

(a) The Regular Army Reserve of Officers consists of physically fit retired Regular Army officers who are younger than certain specified ages.

(b) The Army Reserve consists of enlisted men who have served with the Regular Army. There are three classes. The largest is Section B, for men who enlisted for 12 years of which from six to eight years is with the colors and the remaining with the Reserve. Reservists are paid from 19 to 38 cents per day and are subject to not more than 12 days training a year.

(2) Territorial Army. The Territorial Army corresponds very closely to the National Guard in our service and in time of war is subject to service anywhere. In addition to furnishing antiaircraft and coast defense at home, it provides second line divisions and corps and army troops. See paragraph 3 c. for general organization. The Territorial Field Forces were doubled during the spring and summer of 1939 and half of the divisions are original and half duplicate units. The original divisions in general should be ready for combat duty overseas by the early spring of 1940, but it is estimated that the duplicate units will require at least four additional months' training.

(3) Territorial Army Reserve of Officers. The Territorial Army Reserve of Officers consists of retired officers of the Territorial Army under specified ages.

(4) Supplementary Reserve. The Supplementary Reserve consists of officers and men required to augment the Regular Army on mobilization. There are two general classes: The Infantry Reservists are trained for 26 weeks upon enlistment and thereafter 14 days a year. The other Reservists are in general tradesmen (specialists) who have been given special military training for their mobilization duties or whose civil occupations correspond thereto. They receive limited or no training. Unlisted men receive annual gratuities of from \$30 to \$100 and officers of from \$100 to \$125, with full pay of grade while on active service.

(5) Officers Training Corps. The Officers Training Corps is similar to the Reserve Officers Training Corps in our service, with Senior and Junior

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Divisions. Training is carried out throughout the school year and in camps of from 10 to 15 days' duration. It has not been suspended on account of war.

(6) Home Defense Battalions. These units, before the war called National Defense Companies, are composed of officers and men too old, too young, or otherwise unfit for overseas duty, with the duty of guarding utilities and other establishments. In the main they are consisting of World War veterans.

(7) Colonial Militia. The Militia in Bermuda and Malta provide limited local defense.

#### 4. Equipment.

a. Individual. The individual equipment of officers includes a revolver, caliber .38, 18 rounds of ammunition, steel helmet, gas mask, rations and water. The Infantry rifleman is equipped with a rifle, caliber .303, bayonet, 70 rounds of ammunition, steel helmet, gas mask, rations in ration bag, water in water bottle, and equipment in a haversack and web pack. The greatcoat is not carried but borne in organization transport. One pair of socks is the only clothing not worn. The maximum weight of worn and carried equipment totals 55 pounds. The arms and equipment of enlisted men in other branches vary widely.

b. Organizational. Much of the organizational equipment of the British Army is now in process of being changed from World War to modern types. In general it can be said that regular Army units now have this new equipment but that Territorial units are only now receiving it in any quantity. It seems probable that the entry of certain Territorial divisions into action will be determined by the availability of this equipment. An exception to the above is that most, if not all, Territorial antiaircraft units have now received modern equipment.

(1) Infantry Hand Arms. Riflemen are armed with the Lee-Enfield rifle, caliber .303, weighing 8 lbs., 10 $\frac{1}{2}$  oz., empty, with a sword-bayonet. Its maximum muzzle velocity is 2,400 f.s. The standard pistol is a 6-shot revolver, caliber .38.

(2) Machine Guns. The caliber .303 Vickers heavy machine gun, a World War type, is the basic weapon of the heavy machine gun battalion. The Bren light machine gun is the divisional automatic weapon. Of Czechoslovakian design, it was adopted as standard in 1935 and at present is in large scale production. It is caliber .303, is gas operated, is 45 inches long, weighs 21 pounds, and has a rate of fire of 500 rounds per minute. Ammunition is fed from a curved magazine carrying 30 rounds extending above the chamber. It is normally fired from a bipod, but may be mounted on a tripod, an antiaircraft mount or on an armored automotive carrier. See paragraph 3 d (7) for rate of issue.

(3) Antitank Guns. Two types of antitank guns are used. The Boys antitank rifle is an ordinary bolt action magazine rifle, caliber .55, firing a 930 grain armor piercing bullet at an undisclosed muzzle velocity

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probably about 3,000 f.s. It is claimed that it will perforate 3/4-inch armor at 1,000 yards at an angle of 45°. Its rate of issue is one to each platoon or similar unit commanded by a subaltern. The Vickers-Armstrong 2-pounder antitank gun is a semi-automatic, caliber 40-mm. (1.57-inch) weapon with a muzzle velocity of 2,400 - 2,600 f.s., and a rate of fire of 22 shots per minute. It is carried on two rubber-tired wheels, towed by a 3/4-ton truck. For firing it is lowered to three outriggers. See paragraph 3 d (2) (c) for rate of issue.

(4) Antiaircraft Cannon. Light antiaircraft batteries are equipped with the Bofors 40-mm. automatic cannon, some of which were purchased in Sweden and the remainder manufactured under patent in Britain. This cannon has an elevation of from minus five to plus 90 degrees, 360 degree traverse, and fires a high explosive tracer shell weighing two pounds at a muzzle velocity of 2950 foot-seconds. The rate of fire is from 100 to 120 rounds a minute.

(5) Antiaircraft Guns. The 3.7-inch antiaircraft gun is the standard equipment of mobile antiaircraft gun batteries for home defense and with the Field Forces. It has an elevation range from minus ten to plus 80 degrees, 360 degree traverse, and fires a 28-pound high explosive projectile at a muzzle velocity of 2700 foot-seconds. It weighs 21,280 pounds in the travelling position. It is believed that most gun batteries have been equipped with this gun. A limited number of semi-mobile 4.45-inch antiaircraft guns have been manufactured but it is probable that no more will be produced. This gun has an elevation range of from minus five to plus 90 degrees, 360 degrees traverse, and fires a 56-pound projectile at a muzzle velocity of about 2,350 foot-seconds. It has a firing rate of from eight to ten rounds a minute. This gun can be jacked onto two two-wheeled bogies for movement from one position to another, but must be fired from a previously prepared concrete base. In the firing position it weighs about 30,000 pounds.

(6) Antiaircraft fire control equipment. Vickers and Sperry directors are both standard equipment. Sperry units manufactured in the United States have been delivered continuously since May 1938. It is estimated that all units are now equipped with modern directors. The standard height finder is a self-contained instrument of the coincidence type.

(7) Antiaircraft searchlights and sound locators. The 90-cm. (35.5-in.) antiaircraft searchlight is the standard, being provided in two types, one for hand and one for remote control. At least three types of sound locators are standard. The two latest types each have four paraboloid horns with a base of over five feet, with acoustic correctors and a system of remote control of the searchlight making the use of intermediary comparators unnecessary.

(8) Field Artillery weapons. The following tabulation contains data pertaining to the principal Field Artillery weapons, although there are minor variations between different models of the same gun:

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Type	Cal. Ins.	M.V. f.s.	Wt. proj. lbs.	Max. elev.	Max. range yards	Normal assignment*
13-pounder gun	3	1,700	12 $\frac{1}{2}$	16°	8,700	Horse
18-pounder gun	3.3	1,615	18 $\frac{1}{2}$	37 $\frac{1}{2}$ °	9,400	Divisional**
25-pounder gun	3.45	1,500	25	37 $\frac{1}{2}$ °	12,000	Divisional**
3.7-inch howitzer	3.7	973	20	40°	6,000	Horse
4.5-inch howitzer	4.5	1,000	35	45°	6,800	Divisional**
60-pounder gun	5	2,130	60	35°	16,000	Corps or army
6-inch howitzer	6	1,400	86	45°	11,400	ditto
6-inch gun	6	2,350	100	38°	19,200	ditto
8-inch howitzer	8	1,500	200	45°	12,400	ditto
9.2-inch howitzer	9.2	1,600	380	50°	13,935	ditto

\* See paragraph 3 d (2) for further information.

\*\* Until about 1938 the field artillery battalions of the Infantry division consisted of three batteries of 18-pounder guns and one of 4.5-inch howitzers. At present the divisional artillery regiments consist of six troops (actually batteries), each of four 25-pounder gun-howitzers. It is believed that the supply of this new weapon for the Territorial divisions has not been completed.

Except for the 25-pounder gun all of these weapons are World War types of which there are large quantities on hand. Many of those issued to organizations have been equipped with high speed wheels with pneumatic tires.

(9) Artillery prime movers. The standard prime movers now being procured are 1 $\frac{1}{2}$ -ton, six-wheeled, Morris trucks for light and 3-ton, six-wheeled, Scammell trucks for medium artillery. However there are on hand a considerable number of full tracked tractors, called Dragons, which are still used. The light Dragon, with a chassis similar to that of older light tanks, is used for light artillery; while the Dragon, with a chassis similar to that of a medium tank, is used for medium artillery. The change to wheeled prime movers was due to lessened cost and satisfactory performance.

(10) Trench mortars. Infantry battalions are equipped with 2-inch and 3-inch trench mortars, both muzzle loading and both new weapons. The 2-inch mortar weighs about 20 pounds and fires a two pound high explosive or smoke projectile with a maximum range of 500 yards. The 3-inch mortar fires a 10 pound high explosive or smoke projectile with a maximum range of 1,600 yards. It is transported in three loads with a total weight of 126 pounds.

(11) Tanks. The following tanks are now issued to units, all but the last listed now being in production:

(a) Light tanks. The light tank, Mark VI, weighs almost six tons loaded, is powered with an 85-hp. water-cooled motor, and has a maximum speed of 30 m.p.h. It carries one caliber .50 and one caliber .303 machine guns. Its heaviest armor is 14-mm. (0.55-in.). The crew is three

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men. Due to its short track this tank affords a very unsteady gun platform at speeds above 10 m.p.h. and crosses a four-foot trench only with difficulty. Though only reasonably satisfactory it is in large scale production and no newer light tank is known to be under development.

(b) Cruiser tank. The cruiser tank A9 E1 is a slow, lightly armored medium tank with a crew of six men and mounting one 40-mm. cannon, and one 15-mm. and two caliber .303 machine guns. This tank weighs 13 $\frac{1}{2}$  tons loaded, is 19 feet long, is powered with one 160 h.p. water-cooled engine, and has maximum road and cross country speeds of 23 and 18 m.p.h., respectively. Its heaviest armor is 14-mm. This tank, as well as the A-13 described below, are standard equipment of the heavy armoured units of the Armoured Divisions.

(c) Cruiser tank Mark I A-13. The cruiser tank Mark I A-13 is a modified Christie tank, in that it employs the same suspension but it cannot be converted to a wheeled vehicle. This tank weighs less than 12 tons loaded, is 19 feet long, has a crew of four, and mounts one 40-mm. cannon and one caliber .303 machine gun. It is powered with a 400 h.p. water-cooled engine and has a claimed maximum speed of 50 m.p.h. Its heaviest armor is 14-mm. The adequate power of this tank is one of its best features.

(d) Infantry tank. The Infantry tank Mark I A-11 is a slow, two man, heavily armored tank. For issue to Infantry tank battalions for close support of Infantry. It weighs about 12 $\frac{1}{2}$  tons loaded, is powered with one water-cooled 8-cylinder Ford V-8 commercial type engine, and has a maximum speed of about 8 m.p.h. It carries two inches of armor throughout. It is armed with one machine gun, either caliber .303 or .50. Though this tank is in large scale production it is believed that the type is to be discarded in favor of a three man tank of unknown characteristics.

(e) Medium tank Mark II. The medium tank Mark II is an obsolescent type developed about 1925. Until recently it was the only heavy tank available for use with medium tank units in the Armoured Divisions and the Infantry tank battalions; and it probably has not yet been wholly replaced by new equipment.

(12) Machine gun carriers. The machine gun carrier No. 2 Mark I is a full track vehicle with a chassis in general similar to that of the light tank Mark VI. Unloaded it weighs about 3 $\frac{1}{2}$  tons, is powered with a Ford V-8, 30 h.p. water-cooled engine and has a maximum road and cross country speed of 30 and 20 m.p.h., respectively. Armor is about 5/16-inch. Its basic armament is one Bren light machine gun mounted to fire to the front; but another machine gun or a caliber .55 antitank gun may be carried dismounted in the rear. The crew is three.

(13) Armored scout carriers. Armored scout carriers are standard equipment with divisional mechanized Cavalry regiments. It is believed that they are substantially the same as the machine gun carrier described in the next preceding subparagraph.

(14) Armored cars. A limited number of obsolescent types of armored cars are in the hands of Cavalry units in Egypt and Iraq. Apparently no more are to be purchased.

(15) Engineer equipment. Engineer troops are armed as Infantry.

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Special Engineer equipment, much of it of post-war design, is available in reasonable quantities. More important items are special kapok footbridges for Infantry use, motorized pontoon bridge trains, and special box girder bridges for tanks.

(16) Chemical Warfare equipment. An adequate number of service gas masks are on hand and protective clothing is available in unknown quantities. Little is known of equipment for offensive action, but it is believed that considerable planning has been done, and that the use of chemicals by artillery shell, trench mortar or by spraying from aircraft could be carried out if necessary.

(17) Motor transport. With extremely limited exceptions all transportation of the British Army is motorized. A part of this was in the hands of troops or in storage at the outbreak of war, but a large amount now in use consists of private motor vehicles requisitioned from industry at the outbreak of the war under a system of peacetime registration and subsidy. There are unofficial reports that the British forces in France consider the absence of horse-drawn or pack transportation a handicap in muddy terrain.

5. Training, efficiency and morale.

a. Training.

(1) List of military schools:

<u>Name</u>	<u>Location</u>	<u>Duration principal course</u>
<u>General Schools:</u>		
Royal Military Academy*	Woolwich	18 mos.
Royal Military College*	Sandhurst	18 mos.
Imperial Defence College	London	1 yr.
Staff College - Junior Wing	Camberley	1 yr.
Senior Wing	Minley Manor	1 yr.
Senior Officers' School	Sheerness	3 mos.
School of Equitation	Weedon	10 mos.
Riding Establishment	Woolwich	18 mos.

\* Woolwich prepared cadets for commissions in the Royal Artillery, the Royal Engineers or the Royal Corps of Signals; and Sandhurst for the Cavalry, the Infantry, the Royal Tank Corps, or the Indian Army. The two schools will be consolidated in the near future.

Schools for Fighting Arms:

School of Artillery	Larkhill	4 mos.
Coast Artillery School	Shoeburyness	18 wks.
School of Military Engineering	Chatham	33 mos.
Railway Training Center, Royal Engineers	Longmoor	3 yrs.
School of Electric Lighting (Search-lights)	Portsmouth	14 wks.

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<u>Name (Schools for Fighting Arms)</u>	<u>Location</u>	<u>Duration</u>
Antiaircraft Defence School	Biggin Hill	6 wks.
School of Signals	Catterick	13 wks.
Armored Fighting Vehicles School (in two parts)	Dorsetshire	3 mos.
Small Arms School (in two parts)	Salisbury	2 mos.
Military College of Science	Woolwich	27 mos.
Army Gas School	Porton	
Motor Mechanics School	Aldershot	12 mos.

Schools for Administrative Arms:

Royal Army Service Corps Training Centre	Aldershot	1 yr.
Royal Army Ordnance Corps School of Instruction	Hilsea	1 yr.

Miscellaneous Schools:

Physical Training School	Aldershot	3 mos.
Royal Military School of Music	Kneller Hall	3 yrs.
School of Cookery	Aldershot	3 mos.
Army Technical School (Boys') (three in number)		
School for Training Instructors	Shorncliffe	10 wks.
Royal Army Medical College	London	6 mos.
Army School of Hygiene	Aldershot	4 mos.
School of Dispensing	Aldershot	4 mos.

(2) Education and Training of Officers. The education and training of officers in time of peace varied considerably between branches and between individual officers. Practically all came from the aristocracy or the upper middle class. About three-fourths entered the Army through Woolwich and Sandhurst. While some of the cadets in these schools were from other secondary schools or from the ranks, most of them entered from the public schools (corresponding to "private" schools in this country) which maintained very high educational and disciplinary standards. Cadets, except for those from the ranks, entered Woolwich and Sandhurst during their 18th year for a course of 18 months. Upon graduation their educational qualifications compared favorably with those of graduates of West Point but their military education was inferior. Newly commissioned officers of the technical corps were sent to branch schools for courses that varied in length from two months at the Small Arms School to nearly three years at the School for Military Engineering. However, in the Infantry and Cavalry, the largest branches, officers below the rank of major who were not selected for the Staff College normally attended only the Small Arms School with a limited number of Cavalry officers taking the course at the School of Equitation. In general there were no unit schools for young officers, but many took private correspondence courses to prepare themselves for promotion and Staff College examinations. However most officers below the field grade received

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their principal training in the course of regimental duty. This resulted in a satisfactory knowledge of the technique and minor tactics of their own branches but they learned little of other arms. On reaching field grade most combatant officers not sent to the Staff College attended the three months' course at the Senior Officers' School. Training for high command and staff duty began at the Staff College. About 100 Army officers (in addition to those from other services and from the Dominions) took the one year course at the Junior Wing, selection being determined by competitive examination, with limited exceptions, and limited to officers under 32 years of age. After graduation from the Junior Wing officers performed regimental and junior staff duty. About 35 Army officers were selected for attendance at the one year at the Senior Wing. The only further military education was at the Imperial Defence College attended by five officers from each of the three services and 15 from other sources. The objective of the training of Army officers was to give all of them extensive practical experience with troops, varied by an increasing amount of academic instruction in the technique and tactics of their own arms; with about one-fourth of the total number well trained for staff and high command duty.

(3) Education and Training of Enlisted Men. Upon enlistment most peacetime recruits went to a regimental or branch depot for a course of training of from 14 to 18 weeks. Here they were given intensive instruction in discipline, drill, use of weapons, physical drill and other basic military subjects. They were then qualified to take their places in their units and carry out the regular training schedule. Training of enlisted men within units had as its dual objective the development of disciplined, physically fit and self-reliant soldiers and the qualification of each man in the duties that he would probably perform in time of war. Practically all of this training was given by noncommissioned officers of the unit under the close supervision of officers. Specialists, especially in the more technical arms, were given special courses at the service schools, where the larger proportion of students were enlisted men, in some cases as high as ninety per cent. Illiterates were given general education courses and men physically substandard attended schools for physical improvement.

(4) Unit and Combined Training. In time of peace the annual training of units began with individual training and progressed upward through the platoon to that of the highest unit stationed at one post, which in the case of the Infantry was usually the brigade. On alternate years divisions at home were brought together for combined training which culminated in maneuvers between two or more divisions. In addition to normal combat training, considerable attention was given to exercises in mobility, to coordination with mobile forces and to defense against tanks and aircraft. During the winter months all officers carried out extensive and valuable Tactical Exercises Without Troops which are similar to our tactical exercises. In general the standard of training of companies and battalions was high; but that of the combined arms less satisfactory. Maneuvers of large units were handicapped by the lack of modern arms and equipment and by the absence of the large conscript armies that on the Continent gave commanders and staffs such valuable training. For these reasons the Regular Army as a whole was

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at the outbreak of the present war incompletely trained for modern warfare. The prompt dispatch of its principal elements to France where it has occupied defensive positions along the northern French border has probably not given any great opportunity for training as large units. However training for position warfare and a general integration of the corps and divisions undoubtedly added greatly to the combat strength of the force.

(5) Training of Territorial Army. During times of peace the training of the Territorial Army varied widely between the branches. In the Infantry, for example, recruits were required to perform 40 hours of armory drill and complete a small arms firing course. Thereafter each attended drills for ten hours a year. All officers and men attended annual training camps of from eight to 15 days duration each year. Except for the Antiaircraft Command, training suffered from lack of modern equipment and combined arms training. Due to the critical political situation the Antiaircraft Command was partially mobilized during most of the spring and summer of 1939 during part of which time the units were on the alert at their war stations and part of the time they were at training camps. As a result their state of training at the outbreak of war was generally very satisfactory. The remaining Territorial units were mobilized on September 1, 1939, and have engaged in continuous training since that time. The original divisions should be generally prepared for combat duty on the Continent not later than March 1940; with the duplicate divisions ready some four months later. Certain artillery and service units are already in the combat zone in a satisfactory state of training.

b. Promotion and Retirement of Officers. The system of promotion and retirement set forth in this subparagraph was in effect prior to the outbreak of war. A system of temporary wartime promotions of officers of all classes has been inaugurated. In time of peace combatant officers were promoted to the ranks of lieutenant, captain and major after three, eight and 17 years' service, respectively, subject to examination for all promotions except the first. Promotion to all higher ranks was by selection. Noncombatant officers were in general promoted to the ranks of captain and major after 6 and 12 years, respectively. Retirement was compulsory at the following ages: General and lieutenant-general, 60; major-general, 57; colonel, 55; lieutenant-colonel, 50; major and below, 47. Provision was also made for voluntary retirement and retirement for physical disability.

c. Efficiency.

(1) Officers. British Army officers have a high esprit de corps and a tradition of distinguished service in combat. The professional qualifications of a majority of them are somewhat limited by the extent of the military education and training received. In general they are somewhat less efficient than officers of the principal continental armies, but they make up for this in part by their excellent qualities of leadership.

(2) Men. The efficiency of noncommissioned officers is very high. The rank and file have a high state of discipline but their training for combat is somewhat limited.

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d. Morale. The peacetime morale of the British Army was satisfactory. The British characteristics of courage, tenacity and self-reliance, and traditions of past wars make for a high morale in time of war.

6. Mobilization Plan.

a. Methods of Recruitment.

(1) Officers.

(a) In Time of Peace. In time of peace about three-fourths of combatant officers entered the Regular Army from the two Cadet Colleges, the remainder by competitive examination from universities, from the ranks, or from the Territorial Army or Supplementary Reserve. Noncombatant officers were appointed from civil life or by transfer from combat branches. Territorial Army officers were appointed from the Officers' Training Corps or from the ranks of all Army forces.

(b) In Time of War. At the outbreak of war the granting of permanent commissions in the Army was stopped except for graduates of the Cadet Colleges and others who had previously qualified. At that time emergency commissions were granted, normally in the grade of second lieutenant, to qualified applicants who were ex-officers or had prepared themselves in the Officers' Training Corps or by other means. Now that the initial increases in officers due to mobilization have been taken care of, all future commissions will be made from enlisted men recommended by their commanding officers and duly qualified at officers' training schools.

(2) Men. In time of peace enlistment of men was voluntary for all components, except that in May 1939 the first peacetime compulsory training law in the history of Britain was passed which required all male citizens between the ages of 20 and 21 to register for six months' training with the Army or other defense forces. This conscript force is called the Militia. Only one class of about 35,000 had been called for training prior to the declaration of war. The National Service (Armed Forces) Act, 1939, was passed immediately upon the outbreak of war making all male citizens between the ages of 18 and 41, both years inclusive, liable to military service. During 1939 there were three calls for registration under the Act, making available about 750,000 between the ages of 20 and 23, both years inclusive. There have been large exemptions on account of exempted occupations, physical conditions, and other reasons. With limited exceptions voluntary enlistments after the outbreak of war were prohibited until about November 1st, when volunteers were accepted for the first time. About 100,000 volunteer recruits have been accepted since the war began.

b. Expansion of Units. All during the summer of 1939 existing Regular units were being brought to war strength by calling reserves to active duty and by the assignment of some members of the Militia. Territorial units were being expanded by voluntary enlistments. Upon the outbreak of war all units were further augmented by calling up additional reserves, by voluntary enlistments in certain branches only, and by further assignment to duty of Militiamen. Further expansion and replacements have been taken from conscript

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forces.

c. Creation of New Units. With the exception of some service units, no new units are known to have been created since the outbreak of war. The problem of creation of new divisions will arise early in 1940 but nothing is known of plans therefor.

d. Rate of Expansion of the Army. The following is an estimate of the rate of expansion of the Army, but it can be taken as approximate only as many decisions will be determined by developments that are now not known:

<u>Date</u>	<u>Number Mobilized</u>	<u>Expeditionary Force Available</u>
December 31, 1939	1,385,000	400,000
March 31, 1940	1,600,000	600,000
June 30, 1940	1,700,000	700,000
September 30, 1940	2,100,000	1,000,000
December 31, 1940	2,300,000	1,200,000

e. Progress of Supply of the Army. Where World War equipment is still the standard for issue, and this includes small arms (except the Bren machine gun), most artillery, most ammunition, etc., there is ample equipment for the supply of all units now in service. There are adequate supplies of clothing and individual equipment. Information of quantities of modern equipment is incomplete. It is believed that there is ample motor transportation, and that both Regular and Territorial Army antiaircraft units are fully equipped with modern armament. It is probable that Regular Army units are in the main supplied with modern machine guns, tanks, machine gun carriers, 25-pounder field guns, antitank guns, and other modern equipment; but that issue to Territorial units is so limited that in many cases the full supply will be the determining factor in the availability of the divisions for combat.

f. Reserve Supplies. Details of reserve supplies on hand are not known. In general there are ample reserves of World War armament and reasonable reserves of ammunition therefor. There are few or no reserves of modern equipment and probably only limited reserves of ammunition for modern guns.

g. Procurement of Supplies.

(1) Agency responsible. The procurement of supplies was until August 1939 vested in the Director-General of Munitions Production in the War Office. During that month this entire department, with the exception of those agencies controlled by the Deputy-Master-General of the Ordnance, was transferred to the Ministry of Supply (see par. 1 e.). At the time of its transfer, and presumably little change has so far been made, the department was formed into the following directorates:

(a) Army Contracts. This directorate makes contracts with industry, or supervises those made by lower commands, and allocates orders between Royal Ordnance Factories and industry.

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(b) Ordnance Factories. This directorate administers the Royal Ordnance Factories, which are government owned manufacturing plants, principally for the production of guns, ammunition, tanks, vehicles and other warlike stores for the Army, but which also supply the Air Force, Navy, India and the Dominions with similar items. There were four such factories prior to 1935, of which the most important was Woolwich Arsenal. Between 1935 and the outbreak of the war 18 more were placed under construction. It is believed that over half of these are now in full production and that another quarter are in partial production. Since the outbreak of war six additional factories have been started. Even when controlled by the War Office these factories were managed and staffed entirely by civilians.

(c) Industrial Planning. This directorate was charged with the mobilization of industry for war. See paragraph 5 h. for further details.

(d) Scientific Research. This directorate coordinates the research work of research establishments and committees.

(2) Sources of Procurement. There are five general sources of procurement of munitions for the prewar rearmament program and for war:

(a) The Royal Ordnance Factories are government owned and government operated. In general these factories are confined to the manufacture of small arms, artillery, and ammunition of all classes.

(b) There are an unknown number of government owned, privately operated munitions plants. These plants, which are called "shadow plants" in the aircraft industry (see paragraph 12 g.), have been built at government expense by civilian firms engaged in production of similar items and are operated by the same firms for the government on a contract basis. These plants are supervised by the Ministry of Supply. The number of such plants is not known, but it is known the Imperial Chemical Industries, Ltd., have erected or are erecting five such plants for the fixation of nitrogen and the manufacture of propellants, explosives and cartridge cases.

(c) In a limited number of cases the government has provided equipment to be housed and operated by private firms. This system has not been particularly satisfactory.

(d) Before the war the Army depended for much of its warlike stores on private industry, especially the large armament firms. With the demands of war this dependence is much greater and many companies engaged in civil production must turn to the manufacture of munitions. There are at least five armament firms with large facilities for such production.

(e) Special items have been imported from abroad, especially until facilities for production at home under license are provided. Examples are antiaircraft directors from Sperry Gyroscope Co., New York, 40-mm. automatic antiaircraft cannon from Bofors, Sweden, and mechanical fuzes from Tavoro, Switzerland.

h. System of Mobilization of Industry. Industrial planning in the Army started in 1928 as a direct study of the United States Army's Industrial Mobilization Plan by a few engineers in the Department of the Master-General of Ordnance. Only limited work was done until 1934 when the small group was given additional personnel in 1934. As enlarged this body was detached

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in 1936 and became the nucleus of the Directorate-General of Munitions Production to carry out the rearmament of the Army. The work was carried out by the Directorate of Industrial Planning [see paragraph 6 g (1) (c)], which early in 1939 had a central personnel of about 200. The detailed work of this body is not known; but by the beginning of the war it had made a systematic study of the potential production of munitions of the country. A careful survey had been made of about 9,000 firms and most of them had been allocated either for immediate production of war material or for an early conversion in case of war. During the first month of the war the Ministry of Supply was dealing with some 6,500 contractors and they in turn were dealing with a much larger number of subcontractors. The process of industrial mobilization was made much easier by the huge rearmament program which at an increasing rate from 1936 on fed to private industry contracts that were in essence "educational orders". The legal powers of the War Ministry, but more especially the patriotic attitude of industry, have accelerated this conversion of facilities from peace to war production.

i. Progress of Munitions Procurement. At the outbreak of the war a reasonably satisfactory system of industrial mobilization was in existence and much of private industry was manufacturing munitions in larger or smaller quantities. Since the war began there have been no expenditures of ammunition or wastages of materiel in actual operations and no interference with production or destruction of plants by enemy air attacks. In spite of all these favorable factors it is believed that the production of munitions is not entirely satisfactory. There was increasing criticism of the supply situation in Parliament and in the press late in 1939 and it is possible that this may increase during 1940. The large increases in the Territorial Army and the adoption of conscription in the spring of 1939 provided an establishment far in excess of that contemplated in the rearmament programs up to that time. It is probable that the greatest deficiencies are in new models of small arms and artillery and ammunition for them and in the basic chemicals for the manufacture of propellants and explosives. If, as seems probable, there will be no field operations until the spring of 1940, it is possible that many of these deficiencies will have by then been corrected.

7. Theory and Practice of Combat.

a. Concept of the Conduct of War. British peacetime organization and doctrine contemplated two types of wars; small wars in which the Regular Army initially, and possibly the Territorial Army later, would furnish all necessary troops; and large wars where the entire manpower and resources of the nation would be mobilized. During the spring of 1939 the Government decided that it must prepare in earnest for a large war and this resulted in the doubling of the Territorial Army and the adoption of conscription.

b. Role of the Different Arms in Battle. Infantry, strong in fire power, is the nucleus for combat and must in the end confirm success in war. But to an increasing degree infantry requires the support and close cooperation

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of other arms. Artillery in considerable strength is especially necessary. Mechanized forces equipped with light and medium tanks carry out reconnaissance missions before battle is joined, protect flanks, and are available for use as powerful striking forces for attacks against enemy artillery areas or his supply and command installations, or for use in exploiting a success. A limited number of tank units are available for close support of infantry; and when available in sufficient numbers heavier tanks may be used in mass attacks on a narrow front through enemy main battle lines. The requirements for the protection of home industrial areas preclude the assignment initially of large masses of aviation to field forces, but those available will be used to gain and maintain the supremacy of the air, to provide command and artillery observation, and to attack by bombing enemy reserves and supply and transport installations in the rear areas. Adequate protection against enemy mechanized forces must be provided. It is probable that chemical warfare will be carried out if initiated by the enemy. The use of horse cavalry in any numbers in wars in continental Europe is not contemplated.

c. Method of Conducting Combat. British combat doctrine is based upon a mobile and aggressive offensive. Preceded by mechanized units, the main body with motorized transport will advance rapidly to meet the enemy. In the meeting engagement a coordinated attack, usually on a flank, will be delivered at the earliest possible time. Position warfare will be avoided if at all possible. The defensive will only be assumed as an expedient to delay the enemy until the arrival of reinforcements or for other tactical reasons.

d. War Developments. Conceived in large measure for open warfare, the theories of combat set forth above have received no practical application during the present war. For the present the British and French land forces have adopted the strategical and tactical defensive. The expeditionary force conforms to the action of the French Army and the two are protected by one immensely strong line of permanent fortifications and are faced by another line equally strong. The principal objective of the British Army at present is to raise, train and equip an adequate force and when this is proceeding satisfactorily it can think seriously of combat. There is a British school of thought, which has received no official recognition, that defensive tactics and the use of the counteroffensive will best suit the temperament of the troops and the present state of affairs.

### III. AIR FORCE.

#### C. Personnel Strength.

The following is the approximate estimated strength of personnel on active duty with the Royal Air Force as of December 31, 1939:

	Officers	Men	Total
Regular Air Force	13,000	175,000	188,000
Royal Air Force Reserves	3,000	60,000	63,000
Auxiliary Air Force - Aircraft squadrons	500	5,000	5,500
Balloon barrage	1,000	25,000	26,000
Totals	17,500	225,000	242,500

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9. Organization.

a. General. The Royal Air Force is composed of all military aviation in the services except ship based aviation which is under the control of the Royal Navy. (See paragraph 11 c.)

b. Command. The Royal Air Force is commanded by the Air Council, the composition of which is shown in Appendix 2, Organization of Air Ministry.

c. Air Ministry. See Appendix 2 for a diagrammatic representation of the organization of the Air Ministry. In general the four military departments direct all military activities of the Ministry, with scopes as indicated by their titles.

d. Command Organization. The Air Force is divided into Commands, which at home are tactical or administrative and overseas are territorial, for which see Appendix 2. The Commands at home are divided into groups. The groups in the tactical commands consist of various numbers of squadrons, in some cases as high as 22. These groups are more administrative than tactical. It is believed that these groups have been divided for war purposes into wings.

(1) Tactical and Overseas Commands. The following tabulation gives an estimate of the numbers of units in the commands in August 1939, with schools and small miscellaneous units omitted:

Commands		Total numbers								Total Sqns.
	Groups	Squadrons*								
		B	F	AC	BT	TB	GR	U	DB	
AT HOME										
Bomber	6 Bomber	56						1		57
Fighter	2 Fighter		41					2		43
	1 Army Co-Operation			8						8
Coastal	2 Reconnaissance					2	15			17
	1 Training						1			1
Balloon	10 Balloon Barrage								11	11
Totals at Home		56	41	8		2	16	3	11	
OVERSEAS										
Middle East - Egypt and Palestine		7	2	1	1					11
Iraq		3			1		1			5
India		4		4						8
Mediterranean - Malta							2			2
Aden		2								2
Far East - Singapore						2	2			4
Totals Overseas		16	2	5	2	2	5			
GRAND TOTALS		72	43	13	2	4	21	3	11	

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\* Key to Symbols: B - Bomber; F - Fighter; AC - Army Cooperation; BT - Bomber-Transport; TR - Torpedo Bomber; GR - General Reconnaissance; U - University; BB - Balloon Barrage.

RECAPITULATION

	<u>At Home</u>	<u>Overseas</u>	<u>Totals</u>
Combat squadrons	123	32	155
University squadrons	3	0	3
Balloon Barrage squadrons	14	0	14

(a) Bomber Command. The Bomber Command is responsible for attacking enemy elements and installations. On December 31, 1939, 14 squadrons from this command were in France (see paragraph 9 d (1) (e) below). The remainder presumably were in Britain.

(b) Fighter Command. The Fighter Command is responsible for affording aircraft protection for the British Isles against raiding enemy aviation. For this purpose Britain is divided into three sectors with a fighter group each charged with the defense of a sector. (This change from two to three groups had taken place since war began.) Some of the army co-operation squadrons in the Command have been sent to France and some have been retained in England for training with divisions. Six fighter squadrons were in France on December 31st.

(c) Coastal Command. The Coastal Command is charged with reconnaissance over the sea areas adjacent to the British Isles. Most of the squadrons are equipped with long range reconnaissance land planes, but some are equipped with flying boats.

(d) Balloon Command. The Balloon Command is charged with the maintenance of the balloon barrage system in London and other industrial areas. Each squadron consists of about 60 captive balloons. Areas to be protected have the balloons sited evenly over the entire area.

(e) Air Forces in France. In December 1939 there were two separate air organizations in France. The Air Component of the Field Forces, consisting of four fighter, four bomber and four army co-operation squadrons, was under the control of the Commander-in-Chief, British Expeditionary Forces, for the direct support of the field forces. The Advance Air Striking Force, consisting of two fighter and ten bomber squadrons and a brigade of anti-aircraft artillery (composition unknown, but containing both heavy and light batteries), was an independent unit reporting directly to the Bomber Command in England and available for bombing operations against strategical targets in Germany. This situation was unsatisfactory to all and it has been announced that these two units would be formed into a single command called "The British Air Forces in France" which would operate directly under the Air Ministry but charged with close support of and cooperation with the BEF.

(2) Non-Boatical Commands.

(a) Training Command. The Training Command is charged with the conduct of all schools and other training facilities of the Air Force. In

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(1) Schools.

Imperial Defence College  
Royal Air Force Staff College, Andover  
Royal Air Force College, Cranwell  
Electrical and Wireless Schools (two in number)  
Equipment Training Schools (two in number)  
Schools of Technical Training (eight in number)  
School of Physical Training, Uxbridge  
Flying Training Schools (eleven in number)  
School of Photography, Farnborough  
School of Cookery, Filton  
School of Accounting, Weybridge  
School of Administration, Uxbridge  
School of Army Co-Operation, Old Sarum  
School of Air Navigation, Cranston  
School of Aeronautical Engineering, Diggleswade  
Central Flying School, Upavon  
School of General Reconnaissance, Thorney Island  
Anti-Gas School, Uxbridge  
Air Armament Schools (two in number)  
Air Observers Schools (two in number)  
Airment Training Stations (nine in number)  
Elementary and Reserve Flying Training Schools  
(41 in number in August 1939).

(2) Nature of Training for Officers. Permanent officers appointed from the Royal Air Force College completed at that school a two year course of flying instruction which included 60 hours of dual and 120 hours of solo flying. Upon graduation they went direct to squadrons. Applicants for commissions as short service officers first completed an eight weeks' course at an Elementary and Reserve Flying Training School, a civilian school under contract to and under the partial control of the Air Ministry. Here they received 25 hours of dual and 25 hours of solo flying. Those commissioned then entered a Flying Training School for about 30 weeks of intermediate and advanced flying instruction, after which they were assigned to squadrons for normal service training. Permanent officers had the option of taking the courses at the technical schools and later might enter the Staff College. In general officers specialized on certain types of aircraft and were not expected to be able to fly all types. The professional qualifications of officers on entry into the service were lower than in our service; and the academic professional instruction of permanent officers was also somewhat less complete. Squadron training was very thorough but there was very little training of larger units in tactical operations or long cross-country flights. The objective of the formation of an officers corps with a nucleus of well trained permanent officers and a large body of competent pilots was attained.

(3) Nature of Training of Airmen. Enlisted pilots were trained in the same manner as short service officers. The large number of technical and specialists schools provided a method of mass training of airmen and apprentices to provide for the rapid expansion of the Air Force that has been in progress for nearly three years. It is estimated that in August 1939 about

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20,000 students were enrolled in the various schools for courses of durations varying from a few weeks to two years. After graduation from schools men were posted to squadrons for practical training.

(4) Training of Auxiliary Air Force. Training of pilots and men in the Auxiliary Air Force was accomplished mainly in the squadrons. All members attended a training camp each year for from eight to 15 days and received from 21 to 25 hours training at their home stations. In addition all officers had to carry out at least 12 hours solo flying annually.

(5) Training of Reserves. Officer and enlisted pilots of the Reserves were required to perform 12 hours solo flight in service aircraft each year. Other Reserve enlisted men performed 12 hours service annually.

(6) War-time Changes in Training. The outbreak of war produced two effects on training. The requirements of training became much greater. And at the same time all except southern Britain was reserved for combat aircraft only. With negligible exceptions, all prospective pilots must now enlist in the Volunteer Reserve and go to recruit depots for eight weeks of ground and disciplinary training. During this period all go before an Acceptance Board and about half are earmarked for commissions. At the end of this period all go to an Elementary and Reserve Flying Training School (of which there remain only 19 on account of restricted areas) where they receive the basic training course of eight weeks with a total of 50 hours of flying. Those completing the course then advance to a Flying Training School to take the intermediate and advanced courses of eight weeks each with about 70 and 30 hours of flying, respectively. All of this training is carried out seven days a week using a greater number of instructors and aircraft, so that a student receives the same number of hours of instruction that pupils did before the war in courses nearly twice as long. Of the men completing the instruction, those previously so earmarked are commissioned and the remainder are appointed as sergeant pilots. The syllabus of training has not been materially altered except to speed it up and condense it. The technical training of airmen has also been shortened in a similar manner.

b. Relative Rank of Officers. The following is the relative rank with the other services:

<u>Air Force</u>	<u>Navy</u>	<u>Army</u>
Marshal of the R.A.F.	Admiral of the Fleet	Field-Marshal
Air Chief Marshal	Admiral	General
Air Marshal	Vice-Admiral	Lieut.-General
Air Vice-Marshal	Rear-Admiral	Major-General
Air Commodore	Commodore, 1st & 2d Class	Brigadier
Croup Captain	Captain	Colonel
Wing Commander	Commander	Lieut.-Colonel
Squadron Leader	Lieut.-Commander	Major
Flight Lieutenant	Lieutenant	Captain
Flying Officer	Sub-Lieutenant	Lieutenant
Pilot Officer	Acting Sub-Lieutenant	Second Lieutenant

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c. System of Promotion. In time of peace the General Duties Branch pilot officers, flying officers and flight lieutenants were promoted, subject to examination and certificate of fitness for promotion, to the next higher grade upon completion of 18 months, two years and five years in grade, respectively; except that accelerated promotion for special qualifications might be ordered. Promotion to all higher grades was by selection. Systems of promotion in the non-combatant branches varied widely. For the duration of the current war the peacetime system will be continued, but a system of acting promotions will be utilized to take care of wartime expansion.

d. Efficiency.

(1) Officers. The officers of the grade of squadron leaders and above are competent and efficient. On general the junior officers have had a somewhat inadequate period of training and are satisfactory pilots only rather than well rounded professional military men. All pilots are deficient in cross country flying training. The accelerated pilot training system and the limited areas available for flying will probably cause pilots to be assigned to squadrons in the future to be even less efficient in this respect than in the past. Long range bombing operations and especially the operations of the Coastal Command will correct this deficiency for the pilots taking part in them.

(2) Men. The technical specialists are well trained at school and with experience in squadrons reach a high state of efficiency. Others perform their duties satisfactorily. The rapid expansion in enlisted strength has lowered the average efficiency.

(3) Combat Efficiency and Value as a Whole. The Air Force rates high in combat efficiency. The British are by nature skillful pilots in combat and their training, equipment and temperament make them the equal of the pilots of other European air forces. The accelerated personnel procurement and training will tend to diminish the efficiency of the service as a whole.

e. Morale. The morale of the Air Force is high. Aviation appeals to the British character and the Air Force has the traditions of splendid World War service.

12. Mobilization Plan.

a. Peacetime Recruitment. In time of peace regular officers were commissioned from the Royal Air Force College, university graduates, certain cadets from Canada and Australia, enlisted airmen and from active or reserve officers of the Air Force, Army or Navy. There were two types of commissions. Permanent commissions were given mainly to flight cadets graduating from the Royal Air Force College, with a total of about 50 a year, and a limited number of university graduates. Short service commissions, with four years on the active list and six years in reserve, were given to candidates from other sources. During 1936, 1,339 officers were so commissioned. A limited number of short service officers were given medium service or

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permanent commissions. Officers commissioned in the Auxiliary Air Force ordinarily were university graduates who had been previously commissioned in the regular Air Force. Reserve officers were either regular officers who have resigned or short service officers who have completed their active service. For airmen enlistment was voluntary in all components, except that a limited number of conscripts were allowed the option of serving with the Air Force.

b. Military Mobilization. As a result of the crises during the spring of 1939 some Reserves were called to duty during the summer. On September 1st all Reserves were mobilized. Voluntary enlistment in the Air Force was continued and a certain number of conscripts applying for such service have been taken. The method of procuring pilots is set forth in paragraph 11 a. (6). Engineering and other technical officers have been commissioned direct from civil life. The pilots and technically trained airmen from Australia, New Zealand and Canada produced by the Canadian Empire Training Scheme will upon completion of the course be taken into the Royal Air Force in such a manner that units from the various Dominions will maintain their separate identities. The exact manner in which this will be accomplished has not been announced.

c. Creation of New Units. There is no information that any new squadrons have been organized since the outbreak of war. The supply of trained personnel and aircraft is sufficient to make the creation of additional units probable within the near future, if it has not already taken place.

d. Development of Air Personnel. At the present time it is estimated that the trained personnel are being provided at a rate comparable to the production of aircraft. It is estimated that there are at present in Great Britain over 10,000 military pilots and about 7,500 civilian pilots, of whom a majority have a license for private flying only; and that pilots are now being produced at a rate of about 6,000 a year. It is probable that this rate cannot be greatly increased in the near future in Britain. The rate of training observers, gunners, radio operators and similar personnel is unknown, but is probably sufficient to provide the necessary number of combat and maintenance crews.

e. Empire Training Scheme. In addition to the personnel to be trained in Britain, the Governments of Britain, Canada, Australia and New Zealand have entered into a very extensive Empire Training Scheme to be carried out in Canada. When this Scheme is in full operation there will be some 67 schools in Canada, with training personnel of about 2700 officers, 30,000 airmen and 6,000 civilians. The maximum annual training capacity will be about 11,000 each of pilots, gunners and observers, with smaller numbers of radio operators and navigators. The entire cost of the Scheme will be about \$50,000,000. Pilots from Australia and New Zealand will receive their primary training at home schools, being sent to Canada for advanced training. All Canadian training will be at home. Upon the completion of training all

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personnel, except limited numbers required by the respective Dominions, will be taken into the Royal Air Force. Squadrons formed from personnel from each Dominion will retain their identity as such. This Scheme will run for 3½ years, unless sooner terminated. Since no construction of training facilities has as yet begun and since the training of instructors and other school personnel will absorb so much of the initial output of the schools, it is estimated that the trained personnel available to the Royal Air Force during 1940 will be nominal only and that the maximum output of the schools will not take place earlier than the spring of 1942.

f. Reserve Supplies.

(1) Aircraft. The past Air Force policy has been to hold in squadron reserve (to replace losses or to provide for overhaul) one half the squadron aircraft strength and in depot a 100% reserve. This provides a total reserve of 150% of the combat strength of squadrons. The combat squadrons listed in paragraph 3 d (1) have assigned to them about 2400 planes, which would require a reserve of 3600 or a total of about 6000 combat aircraft. It is estimated that the Air Force on December 31, 1939, had on hand about 7500 modern combat airplanes, so that reserves are definitely in excess of the requirements under the past policy. It is estimated that there are ample reserves of balloons and auxiliary materiel for the balloon barrage.

(2) Other Supplies. It is estimated that the reserves of small arms, ammunition, spare parts, bombs, and general supplies are adequate.

g. Method and Rate of Procurement of Supplies. Supplies other than aircraft are in general procured from the Royal Ordnance Factories /see paragraph 6 g (1) (b)/ or from private industry at a satisfactory rate. Aircraft is procured from the following sources:

(1) Governmental Establishments. Several experimental and research establishments are maintained by the Air Force, the most important being the Royal Aircraft Establishment at Farnsworth. Some special equipment is manufactured in these, but no aircraft except experimental models.

(2) Private Aircraft Plants. There are at present some 20 private aircraft plants in Britain manufacturing military aircraft and five manufacturing aircraft engines. All are in full production on at least two shifts, and it is estimated that in December 1939 they produced about 575 combat and 200 training and other non-combat planes, or over 80% of the total production. When faults with the "shadow" system of production (see next subparagraph) developed, the Government adopted the policy of having all further expansion of production facilities carried out by private aircraft firms. Much of the expansion of their plants during the past two years has been either financed or otherwise subsidized by the Treasury. Shortages of skilled labor, machine tools, special steels, etc., slowed up the expansion program, but by the summer of 1939 production had become substantial and has steadily increased since that time. Production in private plants has by now probably nearly reached its maximum, but it seems probable that additional facilities have been built since that time that should soon come into production.

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(3) "Shadow" Aircraft Plants. Feeling that the private aircraft production capacity was inadequate for war, the Government in 1936 announced a plan for building government owned, privately operated plants, generally called "shadow" factories. These would consist of six principal and ten smaller plants, each to be constructed by a motor car firm near its existing factory, and to be operated by the firm for fixed fees. Of the main plants, one would make engines and fuselages and assemble planes, one would make fuselages and assemble planes, and the others would make engines only. Construction of the plants started late in 1936 or early in 1937, but the first production of engines was late in 1937 and of aircraft about the middle of 1938. It was the original plan that these plants would tool up for the production of certain engines or planes, and that after running a trial order the plant would be closed down and thus represent a potential national productive capacity. Actually the requirements of rearmament were so great that the plants went into maximum production as soon as possible. The plants built are most modern and complete with the finest of machine tool equipment laid out for mass production. But the factories were unduly slow in going into production, in part due to governmental red tape, and in part due to the lack of experience in aircraft production of the management and labor of the motor car firms. The expense was high and it is generally felt that the "shadow" scheme as it worked out was unsatisfactory. The original plants are now producing about 100 combat airplanes a month and an unknown number of engines.

(4) Imports. During 1939 approximately 250 Lockheed Hudson reconnaissance-bombers and 500 North American Harvard advanced trainers were delivered from the United States. Additional orders for these same types have been placed; and negotiations are now under way for unknown numbers of other types. Prototypes of Bristol Blenheim bombers and Hawker Hurricane fighters have been produced in Canada; but it is estimated that there will be no material production of these planes during 1940.

(5) Total Production. As of December 31, 1939, it is estimated military aircraft, combat and training, were being produced at the rate of about 950 a month. If there are no material changes in types and models it is estimated that this rate can be increased to about 1200 a month. However there are reasons to believe that some plants have already changed to new models or will soon do so, with decreases in production that cannot be estimated.

### 13. Use of Aviation During War.

During the war months of 1939 the Royal Air Force generally maintained its aviation in defensive roles. The following is a resume of the use of the various categories of the Air Force during that time:

a. Coastal Command. This Command has carried out reconnaissances over the water areas in all directions, with a general patrol to the coast of Norway. There has been intermittent combat with enemy planes over the North Sea, and it is estimated that little flying is done over the eastern part of

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this body of water. The mission of this Command has been to locate and report hostile naval and merchant shipping and aircraft, and to attack all enemy submarines located. This Command has been quite successful in detecting and attacking submarines.

b. Fighter Command. The Fighter Command has been responsible for the defense of Britain against hostile aircraft. It operates the agencies collecting information of enemy raids and attacks the planes with its aircraft, coordinating closely with the ground antiaircraft elements and the balloon barrage. In general, fighters have remained on the alert on airdromes, but a certain amount of patrolling has been carried out. Where they have been able to intercept enemy planes, the fighters have been very successful in destroying them.

c. Bomber Command. This Command has carried out isolated attacks against naval and air bases, but otherwise has not been used. Particular care has apparently been taken to guard against endangering the lives of civilians. It is prepared to retaliate by the attack on enemy strategic military objectives, such as munitions plants, communications, heavy industry, etc., if such bombing is initiated by the enemy. For this purpose the bomber squadrons in France are available to the Command.

d. Air Forces in France. The British Air Forces in France have the dual role of supporting the British Expeditionary Forces and of operating independently against strategic objectives in Germany. Since the first named mission is nominal only and the second not yet begun, the forces have primarily a defensive role.

e. Overseas Command. The principal overseas air forces are in the Eastern Mediterranean, with mission of reinforcing military and naval forces in that area; and at Singapore where its principal missions are reconnaissance. The overseas commands are kept to the minimum consistent with the missions of cooperation with the other services.

#### IV. NAVY.

##### 1. Strength.

a. Personnel. It is estimated that the strength of the Royal Navy on December 31, 1939, was about 220,000 officers and men.

b. Naval Vessels. The following tabulation shows the strength of the Navy in ships, to include the 1939-40 building program, as of December 31, 1939:

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	Built (1)			Building and appropriated for		Principal armament. Guns
	Under age	Over age	Total	Approx. tons	Approx. tons	
Capital ships	14	-	14	444,550	9	335,000 15"-16"
Aircraft carriers	6	2	8	126,100	7	152,750 4"-6"
Large cruisers	15	-	15	145,620	-	- 7.5"-8"
Small cruisers	23	23	46	311,635	23	158,500 6"
Destroyers	113	73	186	248,734	32	56,050 4"-4.7" (2)
Other surface vessels	4	1	5	27,540	24	28,750 Various
Submarines	17	12	29	32,395	10	9,460 3"-5.2" (2)
Total Tonnages --				1,370,074		740,510

Notes: (1) Age classification based on London Treaty, 1936.  
(2) Most destroyers have two 21-inch torpedo tubes; while submarines have from four to eight tubes of the same size.

c. Air Branch. In May 1939 the administrative control of the Fleet Air Arm was transferred from the Air Ministry to the Admiralty, where it was renamed the Air Branch, Royal Navy. The Air Branch consists of all squadrons manning ship based aviation. In August 1939 the following listed squadrons were in existence:

- 8 Catapult flights
- 3 Catapult squadrons
- 3 Fleet-fighter squadrons, carrier-borne
- 10 Torpedo spotter-reconnaissance squadrons, carrier-borne.

At least three carrier-borne squadrons were aboard the carrier *Courageous* when she was sunk by torpedoes in September 1939. It is not known whether or not they have been reconstituted. In August 1939 it is estimated that the aircraft strength of the Air Branch was about 700, of which about 150 were modern fast monoplanes.

#### 15. Organization.

a. Command. The Royal Navy is commanded and administered by the Board of Admiralty, which consists of the First Lord of the Admiralty (the Cabinet member heading the Admiralty), five Sea Lords, one Civil Lord, the Deputy Chief of Naval Staff, and two civil Secretaries.

b. Organization of the Admiralty. The organization of the Admiralty is quite complex, but in general each Sea Lord, the Civil Lord and the Parliamentary and Financial Secretary is responsible for the administration of certain departments and directorates, of which there are over 30. The Naval

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Staff is headed by the First Sea Lord who is the Chief of Naval Staff. It is divided into the Naval Intelligence, Plans, Operations, Training and Staff Duties, Tactical, and Air Divisions.

c. Fleet Organization and Distribution. Ships of the Navy are divided into the Home and the Mediterranean Fleets, with relatively small forces in China, the East Indies, Africa, West Indies, and New Zealand.

d. Naval Bases. One of the principal strengths of the British Navy is its world wide system of naval bases, fuel stations and protected anchorages. At home there are the large naval bases at Portsmouth and Devonport capable of building and repairing all classes of ships; the smaller naval bases of Chatham and Sheerness for building and repairing light craft; and a considerable number of fuel stations and protected anchorages. In addition there are numerous commercial dockyards capable of building and repairing naval vessels. Overseas there are the major bases of Gibraltar, Malta and Singapore capable of repairing vessels of all classes; and the minor bases of Trincomalee (Ceylon), Hongkong, Bermuda and Colombo (Ceylon), capable of repairing light craft. In addition there are minor bases in most of the Dominions and many fuel oil stations and protected anchorages. All naval bases and some of the fuel stations and anchorages are fortified. The 9.2-inch gun is the major caliber armament of the larger bases. The Singapore base has four 15-inch guns and there are unverified reports that guns of this caliber have been installed at Gibraltar.

16. Training, Efficiency and Morale. The training, efficiency and morale of the British Navy are very high.

#### V. GEOGRAPHIC.

17. Geographic Conditions Affecting Defense. Three geographic conditions affecting the defense problems of Great Britain are dominant. The first is her dependence upon seaborne commerce for imports of food and raw materials and for exports of manufactured goods. This has long made a strong Navy a necessity; and in recent years has made an adequate Air Force equally important. The second is the fact that Britain is an island nation in dangerous proximity to the continent of Europe. This fact makes her ocean borne commerce very vulnerable to a strong hostile Continental power; and has resulted in the adoption of a policy of long standing that she will go to war if necessary to prevent a single nation from dominating Europe. The third condition is that Great Britain has political and commercial possessions and interests in every part of the world that involve her to a greater or lesser degree in almost every international disagreement.

#### VI. RESUME.

18. Resume. The United Kingdom is the industrial and political center of the British Empire, with world wide financial, commercial and shipping interests. From the end of the World War until shortly before the outbreak

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of the present war her dominant policy was the protection of the British Isles and the preservation of the Empire by the maintenance of the status quo. For years she attempted to carry this out within the framework of the League of Nations. In later years her main reliance has been placed on guaranteeing Empire solidarity through the strengthening of Imperial trade relations and communications and on the protection of France and Belgium against unprovoked aggression. The rearmament of Germany which became so glaring by 1935 threatened the domination of Europe. To counter this Britain adopted a rearmament program of her own scheduled to cost \$10,000,000,000 by 1941. This program was increased in 1936 and again in 1939. The outbreak of war in September 1939 found her in a state of partial personnel and industrial mobilization.

a. Army. The traditional British peacetime policy has been to maintain a small volunteer Regular Army, with over half in overseas garrisons, and reasonable forces in the Territorial Army and the Reserves. Until the spring of 1939 these forces were basically intended for defense. About that time the political decision was made to provide for an expeditionary force to send to France. To implement this decision the field forces of the Territorial Army were doubled and, for the first time in history, a limited peacetime conscription was inaugurated. The doubling of the Territorial divisions had been largely completed when war was declared and about 55,000 conscripts had been called to service, but the training of the newly formed forces was negligible. With the outbreak of war general conscription was decreed and men have been called to the colors as fast as training facilities will permit. Most Regular Army units in Britain went to France as the British Expeditionary Force and these will be reinforced during the early months of 1940 with the original Territorial divisions.

b. Air Force. In 1930 the Government announced the policy of maintaining in Britain an Air Force equal to that of any single potential enemy within striking distance. Due in part to the fact that Germany started her large air program over a year earlier and in part to the fact that the British production of modern airplanes was unduly slow, this policy has never been realized. At present the number of modern military aircraft, the number of combat squadrons, and the rate of aircraft production are all materially below those of Germany. And in all types except fighters British combat aircraft are generally slightly inferior to equivalent German models. British fighters carry more caliber .30 machine guns than those of any other nation. Accelerated production at home and purchases in the United States and the extensive Canadian Empire Training Program are all designed to make the Royal Air Force superior to the German Air Force.

c. Navy. The British Navy alone is definitely superior to that of Germany plus any probable future allies. However the defense against submarines, the convoying of merchant shipping, and the patrolling of trade routes place a very heavy burden on this service.

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d. Industry. The constantly accelerated rearmament program since 1936 has had the effect of a limited mobilization of industry. The production of aircraft has been unduly delayed by faulty planning and by British difficulties in attaining mass production. Until the spring of 1939 the production of supplies for the Army was based on the assumption that the existing forces would be used to defend the British Isles and possessions. The large increases in divisions and the plans to send an expeditionary force to France caused large deficiencies in critical items of munitions. Production has been accelerated by building many government factories and by large orders to private industry; but it is probable that maximum production to meet the changed policies will not be reached until early in 1941.

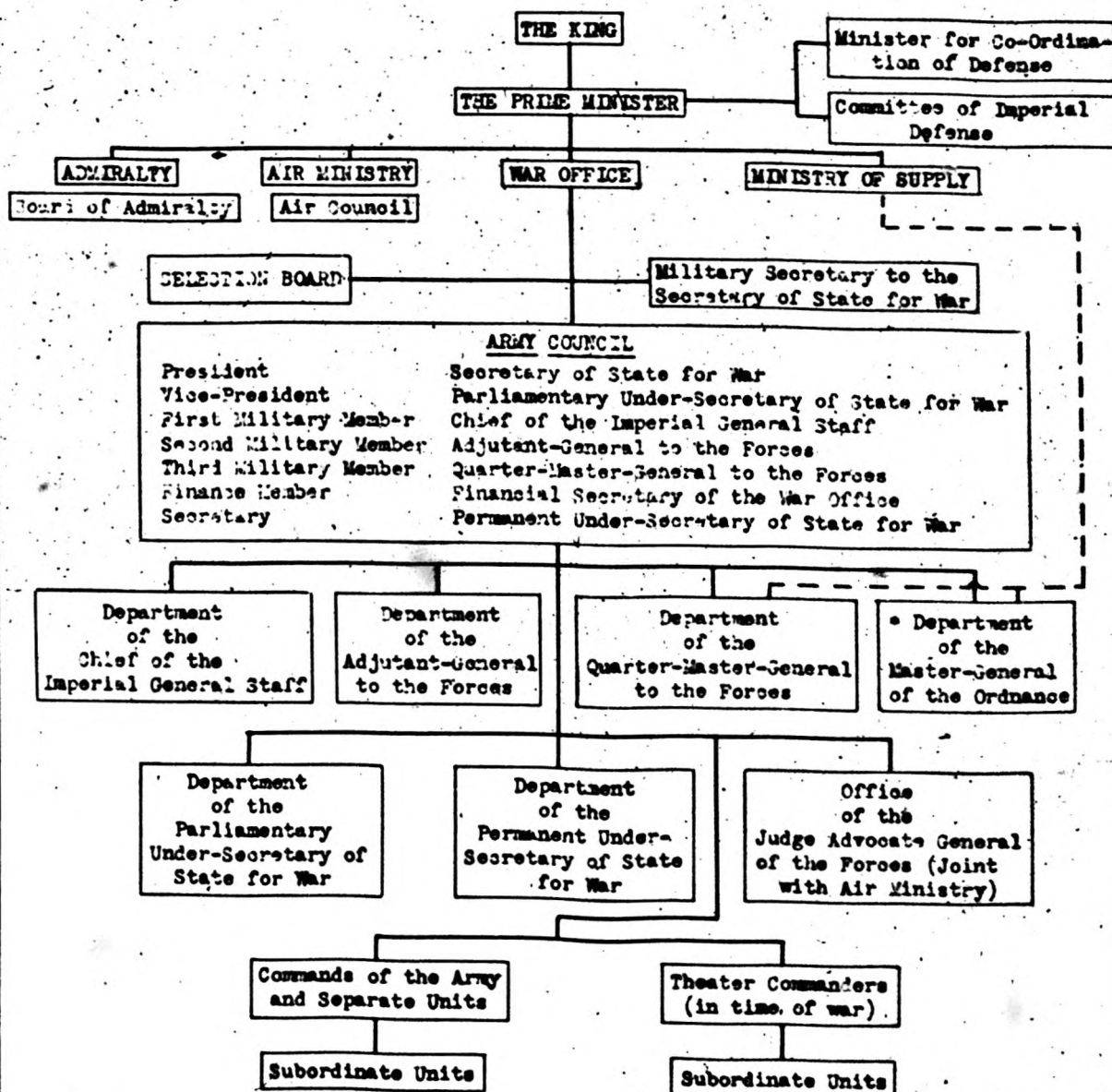
e. General. Upon the outbreak of war the United Kingdom was but partially prepared to participate in a major European war; and in training and production she will not be able to carry out a reasonably large military effort until the spring of 1941.

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Appendix 1 to  
Combat Estimate,  
Great Britain,  
January 2, 1940.

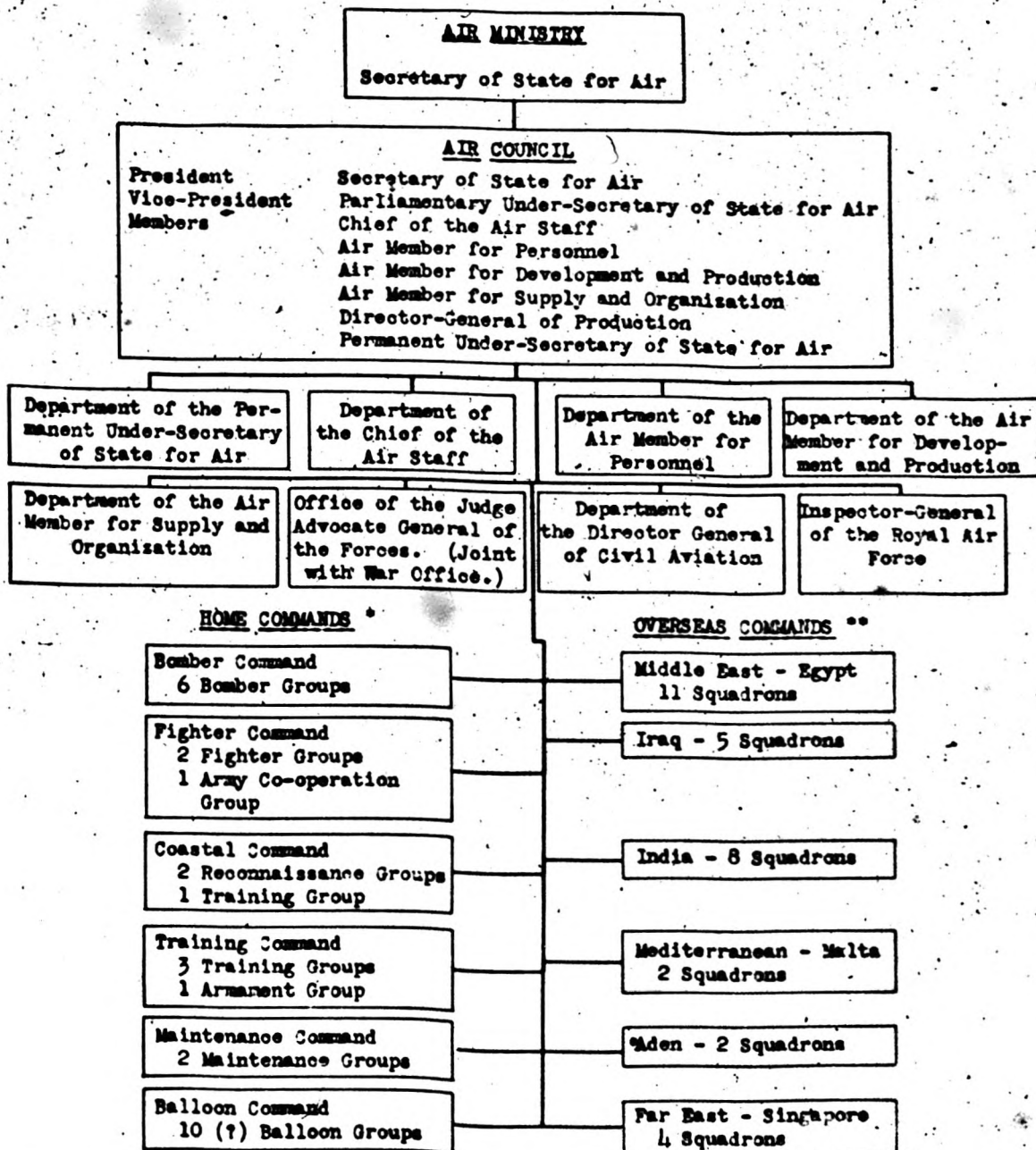
# ORGANIZATION OF THE WAR OFFICE

Showing relationship to other related Ministries.



• See paragraph 3 b. (3) (d) for status of this Department.

# ORGANIZATION OF THE AIR MINISTRY



\* The number of groups shown is of February, 1939, the latest available information.

\*\* The number of squadrons shown is of August, 1939, the latest available complete information. It is known that certain changes have taken place.